



10 Steps to Fleet Electrification

The goal of this guide is to help public entities plan for adding electric vehicles (EVs) to their fleets along with EV charging equipment. These steps are flexible so you can set your own path to reach your goals. The first six steps involve planning; the last four steps involve procurement, construction, and implementation.

Planning:

- [Assemble Key Team Members & Set Goals](#)
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- [Estimate Power & Charging Station Needs](#)
- [Complete a Preliminary Plan for your Charging Sites](#)
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Procurement:

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[Let us know](#) how the guide worked for you or what your organization did differently to make it work better. Thank you!

Our [Green Transportation Program website](#) includes additional resources to support your organization on your journey to transportation electrification. Start with these webpages:

- [Electrifying Public Fleets](#)
- [EV Charging Resources](#)
- [Funding Opportunities](#)

The Washington State legislature passed legislation in 2019 directing the **WSU Energy Program** to establish and administer a technical assistance and education program for public agencies on the use of alternative fuels and vehicles. The **Green Transportation Program** provides education and assistance about alternative fuels and vehicles to all public agencies in the state, including cities, counties, tribes, transit agencies, ports, school districts, colleges and universities, utilities and PUDs, and other political subdivision.

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Planning: Assemble Key Team Members & Set Goals

Successful fleet electrification requires cooperation among leaders and managers from departments throughout your organization. While not all are directly involved in fleet management or fueling decisions, this team will determine best practices to ensure a cost-effective outcome.

General roles are listed below. In smaller organizations, one person may fill several roles.

Team members

Fleet Operator

Responsible for fleet inventory, vehicle selection, dispatch, and maintenance. Likely has access to or manages data about vehicle models, usage and duty cycles, miles traveled, and fuel usage. May be the leader of the electrification effort. Consider using training and materials from [NAFA Fleet Management Association](#) or [Green Fleet](#) to help move forward more quickly.

Facility Owner/Manager

While the facility team will take an active role in installing and managing the charging equipment, feedback from the property owner or lease holder, and the on-site property manager may be required at several points in the process.

Energy/Sustainability Manager

Has access to data on the status of site electricity use and a relationship with the electric utility account manager. They may be familiar with energy or environmental grants, incentives, or rebates; options and opportunities to add charging infrastructure on-site; and tips to encourage employee adoption and charging program success.

Planning Team

Involved in construction planning and permitting. This team will identify the project timeline and the most cost-effective locations to add charging.

Electrician or Electrical Contractor

Estimates requirements for installing new charging equipment. Responsible for all “behind the meter” infrastructure, electrical upgrades, and make-ready installation activities.

Utility/Local Electrical Provider

Assists with meter, transmission, and substation mapping to understand assets and activities the electric utility is responsible for, including power lines, transformers, substation, or city-wide capacity issues on their side of the meter. Can clarify energy costs, fees, or restrictions and how any demand charges or time-of-use rate structures may influence electricity cost. May also cover some of the costs for charging equipment installation.

Finance/Procurement Team

Has access to fuel cost data. May be involved in new fuels planning. Places orders, knows purchasing rules and state procurement guidelines, and responds to requests for proposals or bids.

Parking Management

Enforces parking rules such as reserved sites or on-site parking permits that may impact costs for adding EV charging. May also place bollards, painting and signage; and help decide the location of EVSE or new EV parking in a shared facility.

Convene the team & involve external stakeholders

- Define expectations, roles, and goals. If there is already a team or committee, review progress and define next steps.
- Identify external stakeholders, such as employees, residents, drivers, clients, or constituents, and include them on the team. Stakeholders may also include key service providers or contractors.
- Early outreach and involvement with stakeholders can solidify their support for your actions.

Establish key goals

- Find out if your organization has a climate action plan or emission reduction goals.
- Consider making an “EV-first” pledge to formalize your organization’s commitment to purchase EVs to meet work needs.
- Confirm if your organization is ready to commit staff and financial resources to purchase a specified number of EVs in the near term.
- Establish how many new EVs your organization will acquire in the next two years.
- Set a goal to convert a percentage of your fleet to EVs by a specific year.
- Establish budgetary, environmental, or other policy commitments to guide the planning effort.
- Make sure these initial steps have been discussed, finalized, and approved by your organization—up to the top-level decision makers.

Gather important data

- Encourage team members to bring information and data from their area(s) of expertise, such as data about vehicle models, duty cycles, miles traveled, cost of fuel used, and maintenance costs.
- Calculate the total cost of ownership (TCO) for existing vehicles so you can compare current costs to the TCOs for EVs your organization might purchase.
- Collect facilities and electrical system information, including data showing the patterns of electricity consumption in a typical day.
- Gather finance and procurement information as early as possible.

Planning: Identify EV Candidates

Team members: Fleet operator, energy/sustainability manager, finance/procurement team

Review your organization's vehicle inventory

Many EV models are available to meet a wide range of work requirements. First look at your current inventory of vehicles. After you “right size” your fleet by eliminating or reallocating vehicles that are no longer needed, identify which of your current vehicles should be replaced with EVs.

Start with light-duty vehicles; this is where you have the most vehicle choices, including small utility vehicles, forklifts, and park or landscaping equipment. Light-duty EV sedans are common, and their ranges are getting better all the time. More varieties of EVs—sport utility vehicles, pick-ups, and medium- and heavy-duty vehicles—are coming to the market all the time.

Add data to your vehicle inventory

If not already included in your vehicle inventory, add these data points:

- Vehicle Identification Number (VIN)
- Target replacement date
- Annual odometer readings
- Daily mileage: average and peak
- Duty cycles
- Dwell times or parking/charging windows

Identify suitable EVs

- Review vehicle options from [state contract](#) #05916.
- Check EV availability through joint procurement ventures such as [Sourcewell](#) and [Climate Mayors](#).
- Consider plug-in hybrid options as well as all-battery EVs.

Complete TCO calculations for comparison

TCO calculations will help the team convince decision makers to add EVs to the fleet. Compare costs of:

- Initial purchase cost minus incentives
- Fuel costs with escalators
- Insurance
- Maintenance
- Residual value of vehicle or battery (not just depreciation)

Other things to consider

- Consider starting with two or three vehicles to illustrate lower TCO and encourage further transition planning.
- When considering EV features, think about **must-have** versus **like to have** features. How often do drivers need all-wheel drive or have range needs greater than 100 miles per day?
- Do you have medium- or heavy-duty vehicles coming up for replacement? EVs may be good candidates for grant funding support, especially if you have older diesel Class 4-8 vehicles.

Planning: Estimate Power & Charging Station Needs

Team members: Fleet operator, facility manager, energy/sustainability manager

Calculate electricity needed to charge your new EVs

Estimate how much electricity will be needed to charge your EVs is important when deciding the best charging equipment for your fleet and if the current electrical capacity can meet your charging needs.

EV power consumption varies by time of day, mileage, battery temperature, weather (heater or AC use), driving route, topography, and time the vehicle sits idle (dwell time).

If you are adding a small number of EVs to your fleet, you can estimate power demand by dividing the average and/or peak miles traveled per day by average miles per kWh for each vehicle, as follows:

$$\text{Power demand for an electric vehicle (kW)} = \frac{\text{vehicle energy consumption} \left(\frac{\text{kWh}}{\text{mi}} \right) \times \text{max daily mileage (mi)}}{\text{Vehicle dwell time (hours)}}$$

Level 1 charging: For many PHEVs or EVs with low charging demand (e.g., small utility vehicles, forklifts, landscaping equipment, or all-terrain vehicles), a standard wall outlet on a dedicated circuit may meet the charging need.

Level 2 charging: For EVs that travel 50 or more miles daily, Level 2 charging will likely be required. Many facilities with a 600-amp panel can handle the addition of several Level 2 charging stations.

Level 3 charging (Direct Current Fast Charging, or DCFC): Keep in mind that higher power is often needed to charge medium- or heavy-duty EVs. This is important for evaluating the capacity of your facility's electrical system to meet the greater demand. It is also important for limiting utility demand charges while meeting the charging needs of multiple vehicles.

Factors used to estimate the amount of electricity and time needed to charge each EV are:

- Battery size is measured in kWh.
- Vehicle acceptance rate is the amount of power the OBC provides the battery when charging, in kW. Get this information from the vehicle specs.
- Charging power from EVSE, from 3.8 kW to 7.6 kW (on a 30 A to 40 A circuit).
- Charging speed depends on the charger's kW rating.
- Electrical capacity is the energy needed to charge vehicles at the highest capacity (kWh).

The combined result for all EVs is your fleet's **maximum power demand** or **load profile**. This value is useful when installing Level 2 or DCFC charging stations, and for scheduling how and when to charge each vehicle. Many EVs will never need to be charged at the same time or up to 100%.

Consider duty cycles, drive cycles & dwell time for EVs you plan to charge

- **Duty cycle** is the time of day the fleet (or vehicle) may be in use. Additional duty-cycle information could include the hours or shifts per day, days per week, total miles per cycle, and average or peak load profiles.
- **Drive cycle** includes the maximum and average speeds, number of stops, and idle time.
- **Dwell time** is the time in the vehicle's duty cycle when it is idle or parked and can be charged.

EVs typically don't use a full battery charge each day. When calculating the power demand or load profile for your EVs at the highest capacity, investigate the time of day or night available to charge using data about usage and mileage. This may require knowing if employees take their work vehicles home and need to charge them there, or if the vehicles are left at a fleet site to charge overnight. Survey employees who use fleet EVs to get this information.

To calculate the charging load profile, consider:

- Mileage expected for typical duty cycle, where EV is parked, and how long it is parked each day.
- Battery size and kWh to charge vehicle. For example, the Nissan Leaf may require 24 kWh at 3.3 kW, or 60 kWh at 6.6 kW; Chevrolet Bolt at 7.6 kW; or Tesla at 9.6 kW or 11.1 kW.
- Location of charging depot or distributed charging: For Level 2 at 240 V, vehicle may charge for 4 to 8 hours. For DCFC charging, you can add 26 miles per hour in 30 minutes at 480 V (3 phase).

Consider charging speeds

The charging speed describes how fast energy is transferred from the electrical supply to the vehicle's battery. This varies within each charging level, depending on the electrical supply, the car's OBC size, the battery capacity and state of charge (charge rates taper as the battery nears a full charge and when in extreme heat or cold conditions), battery temperature, and vehicle acceptance rate.

Charging speeds depend on the type of charging equipment used:

- **Level 1 chargers:** Use 120 V, such as a common indoor or outdoor wall outlet. Safe Level 1 charging requires a dedicated circuit, typically 20 A, and is the slowest charging option, charging at 8 or 12 A. Depending on the vehicle's OBC and battery, Level 1 charging may take 16 to 30 hours to charge an EV battery to 90% (adding about 2 to 5 miles of range per hour). *Level 1 charging is typically used for small utility or landscaping equipment, or for PHEVs.*
- **Level 2 chargers:** Use 208 V or 240 V. These charging stations use a 40 A circuit often found in residential, workplace, and public locations. They may be attached to a wall or on a free-standing pedestal. Level 2 stations typically provide a charging rate of about 10 to 20 miles of range per hour. They can take 4 to 8 hours to charge an EV battery, depending on its size. *Level 2 stations are useful for overnight charging or daytime workplace charging. Level 2 is currently the most widespread type of charging.*
- **DC Fast Chargers (DCFC):** Use 480 V power, converting high-voltage AC power to DC power for direct storage in EV batteries. DCFC uses commercial three-phase power. Depending on the vehicle and battery level, it may take 20 to 50 minutes to charge the battery to 80%. *Higher-power DCFC may be the best choice for charging medium- and heavy-duty equipment, buses, semi-trucks, and vehicles with large batteries.*

Planning DCFC charging stations may require new or upgraded substations, so early coordination with the electric utility is necessary to serve vehicle fleets with higher power requirements.

The [Clipper Creek charging schedule](#) is a good resource for light-duty vehicle charging information.

Consider requiring OCPP (Open Charge Point Protocol)

No matter which hardware or network system you choose, OCPP will help you adapt as changes occur in the charging equipment industry. If you are looking at a vehicle with proprietary charging, install an industry standard and provide an adaptor for your specialized vehicle.

Gather data about the new EVs & charging systems

How does your organization want to gather data about the new EVs and charging systems—using telematics equipment attached to each vehicle or with a networked charging system?

- **Telematics equipment** captures data about mileage, topography, and duty-cycles for a program that analyzes current use of the vehicles. If you already track the fossil fuel fleet with telematics, this may be an option with your EVs.
- **Non-networked charging stations** have one functionality—off or on. They don't collect data about charging events or power usage.
- **Managed or networked charging software** offered on the charging equipment can help you meet reporting and data capture requirements for your fleet, which could save time and money.
- **Load management equipment** can shift power use within a facility or within a group of EV charging stations so you can increase power to fewer ports, decrease power to more charging ports, or proactively plan to take advantage of lower electricity rates.
- **Consider the ratio of charging stations and nodes you need.** Do you need one Level 2 charger for each EV, or will adding load management and one Level 2 charger for multiple EVs fit the fleet? Or are your needs so big they require a DCFC drive-through location?

Determine the level of charging that best fits the EV fleet & the site

Consider:

- Typical parking and travel patterns.
- Where will charging occur for specific EVs: on site at a fleet depot, distributed throughout your organization's property, or at the employee's residence?
- When will charging occur: overnight or during the day?

Planning: Complete a Preliminary Plan for Your Charging Sites

Team members: Fleet operator, facility manager, electrician, energy efficiency/sustainability manager, parking team

Prepare preliminary site plan(s)

- Document the team's decisions about:
 - How and when EVs will use the charging stations,
 - If stations will be available for public use or employee personal use, and
 - If special access¹ or fees are required.
- On a photo or diagram of each site being developed, identify preferred parking and EVSE installation locations in relation to an existing electrical panel, utility meter, or cabinet with transformer. See the Site Assessment form (in Resources).
 - Will the EVSEs be wall mounted, pedestal mounted, or other?
 - Factors such as back-in parking may affect the ability to charge some EVs.
- Analyze duty cycles to determine charging needs for each new EV.
- Determine the proximity of the charging equipment to the electrical power service. Placing the charging equipment near an existing power supply will reduce cost, power loss, and time for installation. However, this is not always feasible and is highly dependent on-site conditions.
- For networked charging, ensure the location has adequate cell connection or wi-fi. This is typically only an issue in a parking garage or remote rural area. You may need to add a cell repeater to resolve this issue.
- Prepare to meet with the local utility, charging equipment vendors, and contractors. Bring your electrical system information, photos, and preliminary site assessment.

Consider departmental policy, process & billing

- Employees may need to learn new behaviors when switching from filling up gasoline vehicles to charging EVs. Address how these changes may affect how vehicles are checked out and where EVs should be parked.
- Identify operating issues, costs, fees, and department billing (for a shared facility) that may make each potential charging location ideal, mediocre, or unacceptable.
- Consider revenue models such as letting your employees or the public use the charging stations when they are not in use for the fleet.

Assess power capacity

Gather available electrical demand and usage records for each planned charging location. Determine electrical service and upgrades required to support the charging infrastructure you are considering. Don't forget to consider electricity efficiency measures.

¹ Fleet charging sites located on different properties, at the drivers' homes, or in shared parking areas open to the public are subject to ADA requirements. ADA requirements do not apply to areas restricted to fleet vehicles or to assigned parking spaces.

Complete a site walk through and a site assessment for each planned charging location:

- Walk the site and facilities with a commercial electrician or other electrical professional. Ideally, they will complete an initial electrical survey of the entire facility and create a cost estimate for charging equipment installation.
- Using the preliminary layout plan, investigate selected electric panels, meters, or utility access points to determine the electrical load available for EVSE use. Owners can help by identifying adjacent electrical panels on the property and the current electrical loads.
- If a facility does not have sufficient power, consider using managed charging and load management software to maximize load from the panel.
- Determine capacity required to add dedicated circuits for Level 2 charging stations. Identify which electrical panels have space and capacity to add two-pole 40 amp breakers.
- Complete a load calculation for each panel and EVSE location. The electrician or electrical engineer will work out the final load calculation and determine if charging capacity is available.
- Adjust the charging station locations, if appropriate, to be closer to the best electrical panel locations.

Look at the big picture to save money

- Run conduit efficiently because cost increases with every additional foot.
- When trenching, asphalt is less expensive than concrete.
- Consider integrating work with new construction or electrical projects already planned on site.
- Mitigate cost or other barriers caused by the age of the building or current site configuration.
- Consider future proofing: add battery storage capacity, solar, or battery back-up for resiliency.

Planning: Work with Your Local Electric Utility

Establish how utility representatives can help your team review your preliminary plans, and how they can help coordinate and implement your plan.

Team members: Fleet operator, facilities manager, energy team, utility account manager, electrician (if Level 2) or electrical engineers (if DCFC)

Contact your utility

Contact your utility when you have preliminary plans for adding EVs and charging equipment to your facility. The utility may have an EV customer specialist who can address technical questions, confirm the anticipated electrical usage with new charging equipment, or explain if they have any programs or incentives to support fleet or workplace charging.

Use the preliminary site layout to document known electrical limitations. Understand required upgrades and related expenses. Focus on specific charging sites to determine best fit and lowest cost. Stay flexible on location. A small adjustment in charging equipment placement may save time and money.

Come prepared with questions for the utility

- What is the time of use (TOU) rate structure or EV tariff in your territory?
- What has the utility learned from other installations?
- What are expected service upgrade costs?
- Is a commercial customer education program available?
- What are the cost and timing of utility shut-down requirements during construction?
- Does the utility offer a set fee for pre-paid or bundled utility or construction permits?

Ask your utility representative to provide specific information

- Look for site conditions that require additional upgrades to the panel, transformer, electrical distribution line, or substation.
- Address applicable building codes and permitting processes.
- Discuss applicable time-of-use charges, demand charges, other fees or costs, and how to minimize them.
- Evaluate your installation plans and layout. Provide estimates for any work or improvements that may be required. Document these costs for budgeting.
- Provide tools, data, and incentives to support charging equipment installation.
- Provide insights about customer-side energy management, power sharing, operation, or ownership models that have worked at other public sites.
- Share information about future capacity limitations that could delay construction or add costs.
- Installing DCFC for fleets of medium- to heavy-duty EVs may require significant upgrades, even a new substation, which could take the utility years to plan, finance, permit, and build. The utility might help locate charging capacity in places that require fewer upgrades, faster lead times, or lower costs.
- Gather related costs and draft the installation timeline. Identify any obstacles, additional costs, or needed upgrades.

Future-proof your organization's plans for EVs

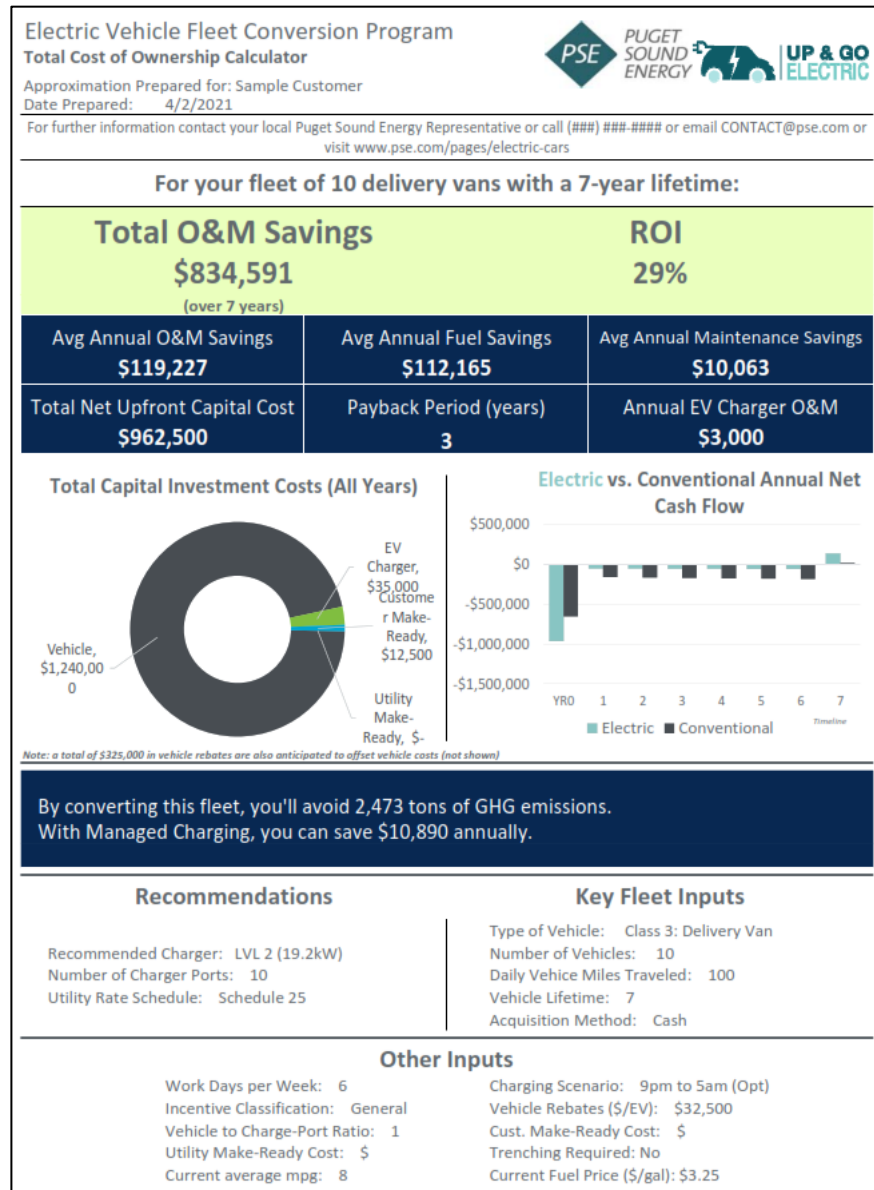
When looking at the electrical capacity at a site, consider additional charging stations you might want to add in the next five to seven years. Discuss these possibilities with utility representatives to see if you can save money by including work now that will be useful for future expansion.

Some electric utilities can evaluate your EV charging needs by looking at your current electrical capacity at the selected charging equipment location(s). By combining your plans to buy EVs, charging stations, and electrical service with the expert assistance of your local utility, your team can refine your plans and prepare realistic scopes of work, estimated timelines, and budgets.

Continue to update the charging site layout, project budget, and timeline. Include the number of EVs that will be added to the fleet, and their makes and models.

Electrical one-line diagram

A one-line diagram is a simplified representation of an electrical distribution system in a single page document. Main components, such as transformers, switches, and breakers (and your new EV charging equipment) are indicated by a standard graphic symbol.



Example of potential benefits and costs of completing a fleet electrification plan. Source: Puget Sound Energy

Planning: Work with Charging Equipment Vendors & Contractors

Team members: Fleet operator, facility manager, potential contractors, electrician or electrical engineers, construction and landscaping contractors

Create an electrical upgrade plan

Talk to charging equipment installers and local electrical contractors to find who works well together and would work best with your organization. Local electrical contractors may offer insights about charging equipment providers.

When finalizing the electrical upgrades, require that the electrician:

- Discuss the EV charging plan with vendors of the charging equipment you plan to install.
- Schedule a walk-through with potential suppliers or contractors to review information gathered by your team and your electric utility.
- Document required electrical upgrades based on hardware specifications and power insufficiencies. You might be able to use load management technology—software solution or networked sharing of existing capacity—to address insufficient electrical or facility capacity.
- Document layout changes needed to ensure cost-effective charging equipment installation.

Create a charging equipment installation plan that includes the panel or meter locations, and addresses special requirements or scheduling considerations.

- Cost out the electrical upgrade work required: added wire, replacement or additional breakers on circuits, upgraded panels, cabinets, and other requirements.
- Add itemized project scopes of work that include detailed budgets for engineering and construction, and verified timelines for installation.

What type of contractor do you need?

In a smaller installation (fewer than four dual-port Level 2 charging stations), your onsite electrician may be able to do this work. For an installation of more than four Level 2 (240 V) or high-voltage DCFC (480 V three-phase) charging stations, you may need to subcontract certain work.

Refine construction costs & considerations

- Clarify which permits are required.²
- Compile costs for facility, parking, or site work that is not included in the electrical design, such as earthmoving and landscaping work.
- Consider if the work may be off property (transformer) or behind a secure gate, which might affect electrical or construction budgets.
- Identify if concrete curbing and parking bollards are needed. Ensure that signage and parking spot painting is completed before charging begins.
- If parking is shared with the public, ensure compliance with ADA regulations and make sure the parking area has acceptable traffic flow after charging equipment is installed.
- If capacity is available, future-proof EV fleet expansion by adding smaller-gauge wire when burying the conduit so additional charging hardware can be added to the existing system.

² Follow NEC 2020- 625.40 EVSE. Typically, one Level 2 240 permit is required per 40 A breaker added. Reference: NEC 625 2015, 2017, whichever is approved by your jurisdiction.

Procurement: Finalize Plans to Purchase EVs & Install Charging Equipment

Team members: Fleet owner, facility and energy manager, parking enforcement, planning team, stakeholders, top departmental sign-off

Finalize your plan for adding the EVs and EV charging locations

Based on recommendations from your local utility, vendors, and contractors, design the layout for installation work. Ensure your site meets applicable EV readiness codes or ordinances. Familiarize yourself with permits required for electrical work and site construction.

Your plan should include:

- Electrical one-line diagram.
- Details about the EVs and EV charging equipment you intend to install.
- Infrastructure construction details, including permitting and landscaping plans.
- Budget, timeline, and funding for each stage of installation. Be sure to include:
 - How your organization will fund the purchase of vehicles and charging equipment (hardware *and* software),
 - Grants or other support to make the program more viable.

Expect to refine the map for fleet parking and the electrical load profile analysis as needed.

Procurement: Complete the Procurement Processes

Team members: Fleet operator, procurement, finance, hardware provider, original equipment manufacturer or EV dealership

Prepare purchase orders or procurement requests

This may require separate documents for purchasing EVs, charging equipment, and/or construction services. Include the vendor contact; EV quantity; specific Level 2 or DCFC hardware, warranty, and network requirements; electrical equipment; and safety materials like paint, signs, and bollards.

Initiate the procurement process

If you have an approved estimate, get a purchase order (PO).

Prepare procurement documents

Some public fleet procurement processes require documents such as requests for information, qualifications, proposals, or bids.

All procurement documents required by your organization should include specifics of the EVs, charging equipment, and/or construction services detailed in the planning steps. Specify when vehicles are scheduled to arrive, and make sure charging hardware is already installed before the vehicles arrive (this may take up to 18 months).

- Finalize the project timeline and circulate it to all team members for contract agreements.
- Consider purchasing an annual or five-year network warranty/maintenance package to ensure repair is provided by the charging equipment vendor when needed.
- Finalize repair contracts with original equipment manufacturers or EV dealerships for maintenance and support not covered by the vehicle warranty.
- Compare hardware and construction cost thresholds with procurement on the [State Vehicle Contract](#) and with collaborative purchase agreements.
- Synchronize charging equipment installation with vehicle arrival. Timing matters: depending on the size, the charging equipment installation can take 3 to 36 months.
- Consider shared purchase collaborative or co-operative resources like [Sourcewell](#) or the [Climate Mayors Electric Vehicle Purchasing Collaborative](#).
- Seek out expertise from the Washington Dept. of Enterprise Services and state contracts for [EVSE \(04016\)](#) and [Motor Vehicles \(05916\)](#).

Grants & utility incentives

Learn about state financing opportunities that could support vehicle procurement or hardware installation. Check with the departments of Transportation, Commerce, or Ecology. Also see if federal incentives and opportunities are available from [Federal Transit Administration](#), [U.S. Department of Transportation](#), or [U.S. Department of Energy](#).

Have a scope, timeline, and budget ready to go for when the right opportunity pops up. Try to include innovative elements or features that would make your plan stand out in a grant competition.

Procurement: Installation

Team members: Fleet operator, facilities manager, planning, parking management, contractors

Create the installation contract

Finalize the contract and get approval to initiate construction and utility work.

- Include the planning and procurement documents with the make-ready work for installing EV charging stations.
- Ensure compliance with local building codes.
- Ensure permits are requested and approved.
- Post applicable zoning and parking rules, especially if the area is publicly accessible.

Permits

Your local jurisdiction or utility may offer streamlined permitting.

- Create a comprehensive list of permits (besides electrical) required by local building officials.
- Work with the installer/contractor to initiate and secure permits.
- Plan the permitting and inspection timeline.
- Track permit fees.

Best Practices

- Be flexible. Even with the best planning, you may need to change charging and EV parking locations. Be prepared to offer alternatives that may enable more affordable charging.
- Innovation and effective communication are crucial.

Procurement: Implementation - Driver Engagement & O&M

Team members: Fleet owner, fleet operations and maintenance (O&M), energy efficiency team, and those involved with employee and fleet driver engagement

Encourage employee adoption & smooth operation

Create or adopt programs to support your employees and drivers as they get used to the EVs and charging equipment. Your organization will likely add new processes to encourage driver engagement, O&M support, and good data collection.

- Focus on changes that relate to the new type of vehicle, and plan training around the new charging and parking processes.
- Once the charging stations are installed and you are gathering data, create a smooth and cost-effective O&M plan to support any warranty with the vehicle manufacturer or dealership.
- Take advantage of training opportunities provided by the vendor or on the web.

Engage drivers

To help drivers engage with new EVs:

- Offer a Ride & Drive event to encourage your employees to check out the new EVs and communicate the importance of adding EVs to the fleet.
- Publish a map illustrating parking changes, including bollards, signage, and parking spot painting.
- Highlight changes in parking rules or expectations, vehicle check-out and drop-off processes, and how to re-charge at work and at home.
- Ask the manufacturer to offer a driver training program for medium- and heavy-duty EVs.

Integrate EVs into the shop

Encourage the training the maintenance team to:

- Seek out local and workforce training opportunities. Ideally, this process will start as soon as the decision is made to electrify the fleet.
- Offer training to prepare employees to transition to EVs.
- Train staff on using the charging stations.
- Involve employees in repairing and maintaining charging station hardware if you did not purchase networked EVSE or warranty.
- Track fleet carbon reduction improvements

Track the gains you expect; your data will tell the story of cost-savings and carbon reduction.

- Calculate the new TCO based on maintenance and energy savings. Networked charging equipment reporting offers way to capture low-carbon fuel standard data and greenhouse gas tracking.
- Document impacts on current car check-out or fueling programs. Networked charging equipment may help simplify departmental fuel chargeback, which may be a relief in shared parking/fleets.

Track TCO

- As soon as you begin the EV transition, track efficiency savings for all fleet improvements. This will improve your future TCO calculations.
- Report data collected and findings, such as reductions in fuel and vehicle maintenance costs.